

CLAIMS

1.- Hydraulic device for injection of bone cement in percutaneous vertebroplasty, that comprise four main parts, namely: injecting syringe, pressure exerting body, hydraulic transmission tube, an manual impulsion and fluid control syringe; the injection syringe is a commercially available disposable 3 ml hypodermic syringe placed next to the patient; the hydraulic tube for pressure transmission, of 1.0 m to 1.5 m length, placed between the injection syringe and the pressure exerting body; the manual impulsion syringe placed after the hydraulic tube and near the operator, characterized by the pressure exerting body consist of hollow cylindrical body in the form of inverted syringe of larger diameter with an adapted ending like an open bolster with the largest external diameter and two diametrical opposed cuts like oval entry, also in the other end one tip of reduced diameter; an peripheral groove in the internal wall of such bolster, couples tightly the wings of injection syringe in a revolved way; such pressure exerting body has a movable piston on axial direction to define two chambers, namely, internal and external.

2.- Hydraulic device of injection of bone cement according to the claim 1, characterized by the cylindrical hollow of pressure exerting body (1), in form of an inverted positioned syringe that renders mechanical advantage to the force exercised in the manual syringe, it has a larger diameter and consists of a joining bolster with internal peripheral groove where are coupled the wings of injecting 3 ml syringe; a body cylindrical lengthened hole of 10 ml of volume that contains a first free camera where the plunger (c) of the injection syringe lodge inside the cylinder until coupled with the moving internal piston (4), and a second internal camera (5) occupied by a hydraulic fluid, this cameras are separated by such piston (4) surrounded by a rubber cap that seals the internal wall of the body of pressure and avoids leakage of the hydraulic fluid; a final end tip of reduced diameter that is connected in a hermetic way to the hydraulic tube (7).

3.- Hydraulic device of injection of bone cement according to the claim 2, characterized by the bolster is adapted to receive in a first predetermined position of an oval

entry (70) the wings of the injection syringe, and in second position by a 90° turn in a peripheral groove (90), placed in a tight way.

4.- Hydraulic device of injection of bone cement according to the claim 1, characterized by the manual syringe (8) is a lengthened syringe that has a smaller diameter than the pressure exerting body in a 2/1, 3/1, 4/1 ratio, it is connected in continuation, far from the application point by a hydraulic tube.

5.- A method of operating the device for injection of bone cement that comprises:

to insert a bone biopsy needle in the place where the bone cement is to be delivered.

to connect the injecting syringe, loaded with the cement, in continuation of the needle;

to couple in a revolved way, the injecting syringe in the internal peripheral groove of the bolster of the pressure exerting body;

to exert pressure on the plunger of the injecting syringe by means of the force exerted in the plunger of the manual syringe placed in the other end of the hydraulic tube, this way, the content of the injecting syringe is injected in the patient's vertebral body;

to retract the plunger of the manual syringe to withdraw the internal piston of the body of pressure in position to receive a new loaded cartridge of bone cement;

to uncouple the injecting syringe from the bolster of the body of pressure;

to disconnect the empty syringe from the needle placed in the patient's body;

to couple the new cartridge of bone cement (injecting syringe) in the needle and bolster of the body of pressure, and repeat the previous steps to place another new cartridge of bone cement, until completing the filling of the vertebral body.